5. STORMWATER MANAGEMENT REPORT AND EROSION & SEDIMENTATION CONTROL REPORT

5.1 OVERVIEW

Stantec has prepared a Stormwater Management Report and Erosion & Sedimentation Control Report for submission with this application.

5.2 ATTACHMENTS

Attachment A – Stormwater Management Report
Attachment B – Erosion & Sedimentation Control Report

ATTACHMENT A

STORMWATER MANAGEMENT REPORT

STORMWATER MANAGEMENT REPORT
(GENERAL STANDARDS)

CANAL LANDING NEW YARD
100 WEST COMMERCIAL STREET
PORTLAND, ME

PREPARED FOR

NEW YARD, LLC
100 WEST COMMERCIAL STREET
PORTLAND, MAINE 04101
(207) 774-1067

PREPARED BY

STANTEC CONSULTING LTD.
482 PAYNE ROAD
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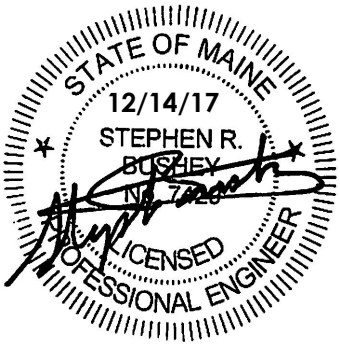

DECEMBER 2017

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Figures and Photographs (See Attachments to Application)

STORMWATER MANAGEMENT REPORT

1.0 INTRODUCTION

Canal Landing, LLC proposes to construct, own, and operate a new boat maintenance and repair yard within approximately 17 acres of land located prominently along the West Commercial Street waterfront. The project represents an ideal reuse of a former highly industrialized property that has been relatively inactive in later years. The property maintained a prominent role in the City's Waterfront District for well over a century and a half as the Maine Central Railroad operated active business interests up until at least the 1970's.

The proposed project includes multiple buildings to be constructed over multiple phases along with new shorefront uses including one or more boat ramps, docks, new or reconstructed piers and a travel lift basin. The applicant's plans include up to three buildings constructed to support the boat maintenance and repair operations. Additional future buildings are also contemplated to support marine related operations including retail/warehouse space, yacht brokerage/sales, marine product processing and the potential of large vessel berthing.

The Phase III project includes site development activities involving Buildings C and D, earthwork, grading, shorefront stabilization, building construction, utilities and overall site stabilization.

This section of the permit application presents the Stormwater Management Plan designed for the Phase III project activities. The stormwater management design presented herein will show that it meets the criterion of the City of Portland stormwater requirements and the adopted MeDEP Chapter 500 Regulations.

The site discharges to the mouth of the Fore River where it meets the ocean. Due to these tidal conditions, **the applicant is requesting a waiver of the flooding standards**.

The proposed stormwater quality treatment plan utilizes the 'Manmade Pervious Surface' approach listed in the Maine Best Management Practices (BMPs) to meet the stormwater quality standards required under the general standards as outlined in the adopted MeDEP Chapter 500 Stormwater Management Technical Manual. The manmade pervious surface (throughout much of the boatyard site) is intended to provide water quality treatment for close to 100 percent of the proposed development area. The applicant has also studied the guidelines set forth in the Brightwork BMP Manual for Maine's Boatyards and Marinas with regard to typical boatyard processes and potential sources of contamination and will conduct boatyard activities in accordance with these guidelines as they have in the past.

USGS, aerial photographs, and related maps are appended to the Site Plan Application.

The applicant has prepared this report to show the proposed Stormwater Management Plan meets the City's General Stormwater Standards.

2.0 EXISTING SITE CONDITIONS

The site consists of approximately 17.77 acres of land that is composed of three primary areas described as follows:

1. **Retained Parcel (Map 59A, Lots 3 & 4)**: Consists of the retained 5.03-acre area owned by New Yard, LLC and it represents the retained land originally permitted by the Applicant during late 2012 – 2013. Within this land area New Yard, LLC has constructed Building A and Building B amounting to approximately 48,000 SF of building space. This parcel contains a new boat ramp and boat yard area currently in use by Portland Yacht Services.
2. **Shorefront Parcel (Map 60F, Lots 3 & 4)**: This area is irregularly shaped and contains approximately 1,581 LF of waterfront. The site area is approximately 5.99 acres. This area is currently undeveloped except for the granite revetment wall that historically supported the former waterfront pier.
3. **Street Front Parcel (Map 60F, Lot 1)**: This 6.75-acre area contains approximately 2,160 LF of street front. The property is generally unoccupied although there are existing rail tracks that previously provided access to the former NGL Distribution facility within what will be IMT expansion area in the future. Towards the east end of this parcel, historic land use has included parking of vehicles, trailers and similar activities associated with businesses further east on Commercial Street. Most of this use was unauthorized by the previous landowner, Portland Terminal Co.

Existing development in the area includes the following:

- The City of Portland Marine Terminal and expansion area is located to the east of the site.
- Commercial activity including Nova Seafood and Graybar Electric operate out of buildings on the north side of Commercial Street.
- The Portland Star Match Co. building lines up opposite the site.
- The State of Maine now operates rail tracks into the propane storage yard and IMT expansion area. These tracks were completed very recently.

Owen Haskell, Inc. has completed a topographic survey of the property. The site is relatively flat with the highest points along the Commercial Street frontage, sloping to the shorefront. Site elevations along Commercial Street trend down from west to east from elevation 23' (NGVD 1929) to elevation 16' at the westerly end of the Commercial Street frontage. The site's low areas are near elevation 9'-10' while most of the waterfront top of bank is between elevation 9'-11'. The High Annual Tide Line (HAT) for the Fore River is elevation 7.4' and mean low water is approximately elevation -4.0'. Owen Haskell, Inc. has also completed bathymetric survey data collection and found water depths within 50' of the low water line to be 10' to 30'. The Federal Channel is also represented on the project's drawings and it is generally located 60' to 120' off the shorefront. No activities are proposed beyond the Federal Channel line. The manmade pervious surface approach is considered the most practical choice for meeting

the projects stormwater management needs. The experience thus far on the first phase area has been positive with respect to how the Boatyard surface functions for handling rainfall and stormwater.

Generally speaking, the site's runoff either infiltrates into the ground or drains directly to the Fore River via overland flow. There are no drainage systems on site, although there is a closed storm drainage system within Commercial Street. The Commercial Street drainage system ultimately ties into a CSO line located on the west end of the site as well as a second CSO line on the east side of the site.

Due to the site's historic industrial condition nearly all of the surface consists of sand and gravel fill, rail ballast or otherwise sparsely vegetated ground surface. The following Figure 1 shows the extent of previous rail use across the property.

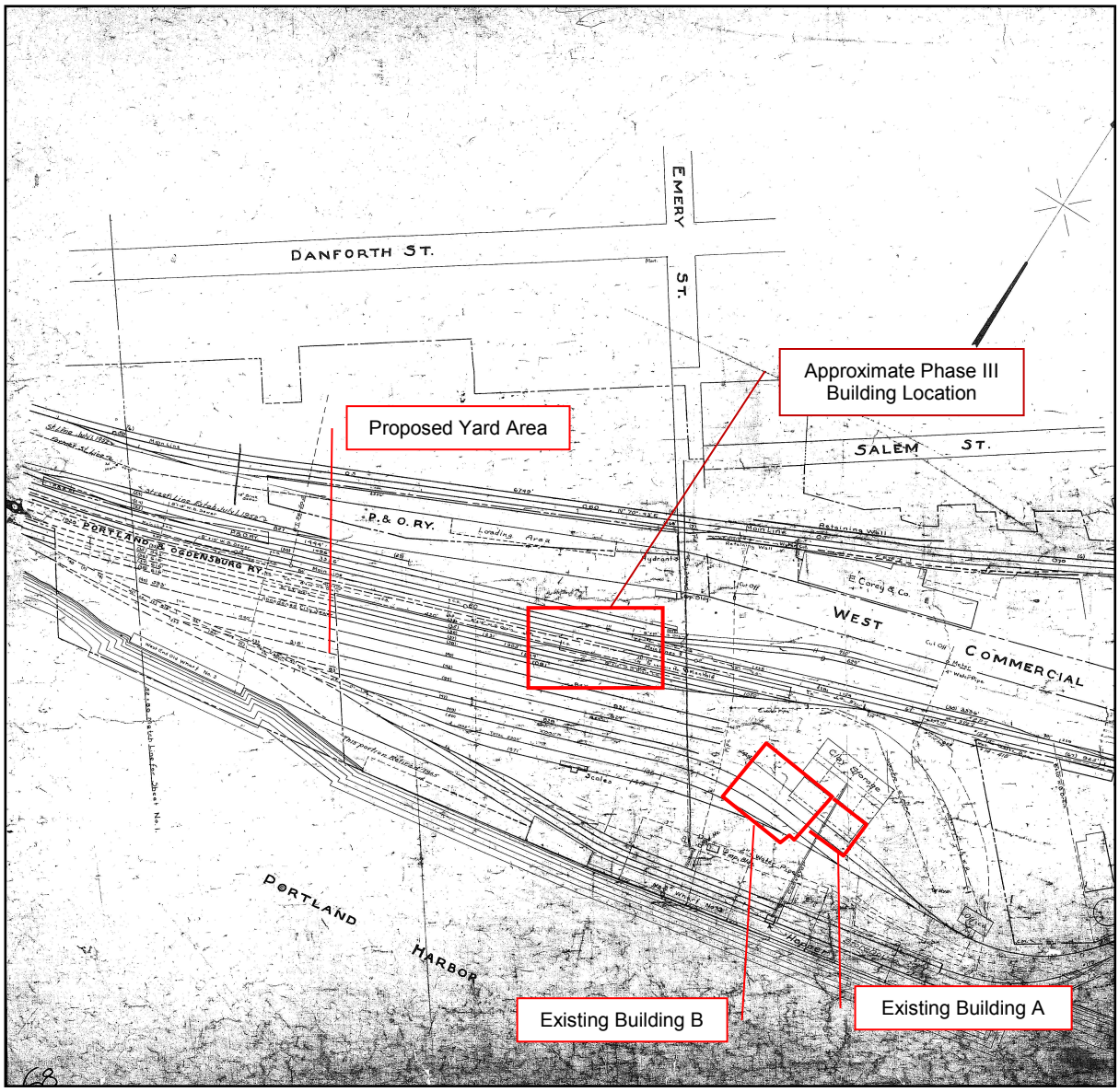

Figure 1 – Historical Rail Yard

The site's soil layers are generally characterized as follows:

- 10 to 15 feet of sand and gravel fill, there is little to no organic surface layer throughout the site.
- 5 to 10 feet of silt and sand.
- 10 to 40 feet of gray clay identified as the Presumpscot formation.
- 30 to 40 feet of dense silty marine sands.
- An undetermined thickness of dense silty sand and gravel identified as glacial till overlaying bedrock.

Observed soils conditions at the ground surface include fill material containing coal, and coal ash comingled with scarified sand and gravel. Eroded soils conditions have been observed along the shoreline in and behind the existing granite revetment wall and remnant pier areas. The project's site development activities include restoration and rehabilitation of these areas.

According to various investigation data, depth to groundwater varies from 3 to 7 feet and this likely varies with tidal conditions in the Fore River. Generally speaking, the groundwater flows from the northwest to the southeast across the site.

Figures 8, 9, and 10 appended to the report provide the USDA medium intensity soils, sand and gravel aquifers, and surficial geology for the site.

3.0 PROPOSED PROJECT

The applicant proposes to redevelop the property in a manner consistent with the WPDZ Standards. The development program includes the following components:

ONSITE

The development program includes phased development of boat maintenance facilities and future ancillary marine related uses. Phase III and future Master Plan development activities are summarized as follows:

Phase III – Will Include:

- Site clearing, stabilization and general clean-up.
- Construction of a 19,800 SF building for marine retail and a 4,800 SF ancillary office/sales/administration building. The Phase III building area will also include paved parking and related site improvements around the buildings.
- Establishment of yard areas and surfaces for heavy equipment travel lift trucks, and boat display, storage, and repair. (Repair and maintenance often takes place outside, particularly if the vessel is large and does not fit into a building. Boats that are out of the water for the winter season all need to have work done on them to prepare them for re-launching.)

- Installation of utilities for building and yard area use as well as future phase activities.
- Minor landscape preservation and tree planting.
- Shore front stabilization including revetment repairs and riprap stabilization.
- Preparation of a 2 to 3 acre secured marine cargo area on the west end of the property. This area may be used for the parking of vehicles, equipment or related cargo associated with the Downtown waterfront.

OFFSITE

Site access is proposed via Commercial Street as well as from the Fore River. Three driveways are proposed (two of which are already constructed and actively used) and are identified as the western, central, and eastern driveways on the site plans.

An Erosion Control Plan and narrative were previously submitted (October 2012) and approved by the Planning Authority. An updated Erosion Control narrative is included in this Phase III submission. The requirements in the original plan and updated document continue to apply therefore no further information regarding compliance with the Basic Stormwater Standards will be provided.

4.0 REFERENCES

- Brightwork – A Best Management Practice Manual for Maine's Boatyards and Marinas, December 2005
- Erosion and Sediment – *Maine Erosion and Sediment Control BMPs", published by the MeDEP in 2003 http://www.maine.gov/dep/blwg/docstand/escbmps/index.htm*
- City of Portland –Code of ordinances, Section 32 Rev. 9-17-09
- Portland Stormwater Management –Section 5 Adopted 7-19-10.
- Stormwater Management for Maine Volume III – BMP Technical Design Manual
- Chapter 500 DEP Rules, revision October 2010.

5.0 MODELING SOFTWARE

Microsoft Excel 2007, Microsoft Corporation – used for spreadsheet computations.

6.0 PRESENTATION OF ANALYSIS

The stormwater analysis has been performed for the project to determine the requirements of the City of Portland, Section 5 and adopted MeDEP Chapter 500 Stormwater Rules and to show a plan which will generally meet the requirements with the exceptions noted herein.

7.0 ASSUMPTIONS

- That detention will not be required to reduce the peak flow rate or meet the flooding standards. **A waiver of the flooding standards is requested**.
- That the native soils/gravels will have infiltrative properties that meet the requirements of the Maine DEP BMP proposed. Note: **A waiver is being sought for infiltration testing**. Evidence from the previously developed area of 5.03 acres for Phase I/II activities supports the proposition that the soils are highly infiltrative.

8.0 STORMWATER MANAGEMENT OBJECTIVES

The goal of the Stormwater Management Plan is to design, operate, and maintain the development to avoid downstream erosion or significant water quality impairment.

This goal will be achieved by:

- Designing the project to meet the Portland Stormwater Management Standards adopted 7/19/10 and General Stormwater Standards of MeDEP (revised October 2010).
- Designing water quality measures to provide long-term removal of non-point contaminants.
- Implementing a plan to control erosion, sedimentation, or fugitive dust emissions during construction.
- Implementing operational processes to avoid toxic pollutants from boat yard activities, both organic chemicals and heavy metals, from entering ground and adjacent water bodies.
- Maintenance of the Stormwater Management System in accordance with the Stormwater O&M Manual (provided as a separate document) and MeDEP Brightwork Manual.

The plan has been designed in accordance with the City of Portland Stormwater Rules.

9.0 STORMWATER MANAGEMENT QUALITY SUMMARY

Approach

To meet the General Standards, our office reviewed the list of options of MeDEP's accepted Best Management Practice (BMP) options to provide water quality treatment including grassed underdrained filter, bio-filter, proprietary devices and infiltration trenches for the expanded New Yard site. Following this review and incorporating knowledge of the site and the goals of the client, it was realized that developing a method for providing stormwater quality treatment that utilizes the proposed crushed stone surface (desirable to applicant for boatyard use and related activities) and infiltrating the runoff into the underlying soils would be preferable both functionally and economically. According to the MeDEP BMPs this is known as a "Manmade Pervious Surface" approach to stormwater quality treatment.

A pervious pavement consists of a permeable surface material and subbase materials that allow penetration of runoff in to the underlying soils. The system must be designed to store and infiltrate the water quality volume (1.0" of impervious area and 0.4" pervious area) with the remainder (larger storm events) discharged through an 'over-flow' device. The effectiveness of the system depends heavily on long term inspection and maintenance.

Following a review of the design criteria for a "Manmade Pervious Surface", it was determined that the selection of at least a 3" thick crushed stone surface across the entire 'prepared surface' area designated on the site plan is appropriate. This layer of stone will act as a reservoir for the 1" storm event. The material may be placed over geotextile fabric and infiltration into the existing underlying gravel will meet the requirements of this BMP. Runoff from larger storm events may flow to a closed collection system conveying flow via pipe to the existing CSO lines that traverse the site. Alternatively, flow may be distributed to portions of the site designated for future development where longer term absorption may occur. Internal drains within the buildings connected to the sewer system and storage tanks/collection systems beneath the concrete washdown aprons (at the travel lift basin and boat ramps) will minimize the potential for petroleum, etc. to enter the stone areas.

Our office has laid out a plan which utilizes the "Manmade Pervious Surface" BMP to provide water quality treatment as described in Chapter 7.7 of the MeDEP Volume III BMPs Technical Design Manual meeting the minimum treatment standards as required by the General Standards. The project drawings provide extents and details of the manmade pervious surface proposed. This pervious surface is represented by the 'prepared surface for boatyard' on the site.

The basis of design of treatment method is as follows:

Compliance with BMP Design Criteria:

Traffic Volumes:

Traffic volumes will be low across the area. Some heavy vehicles including tractor trailer trucks and Marine Travel Lift will maneuver across the crushed stone surface. However, the majority of the surface will be utilized for boat display and storage. The applicant proposes to manage the crushed stone surface by routinely raking and grading to minimize the buildup of fine particles that might impact the materials absorptive capacity. Removal and replacement of this gravel layer may be required over time.

Grading:

Grades across the crushed stone area will range from 1 - 2%, thus meeting the <5% slope recommendation.

Sediment Loading:

The crushed stone area is not expected to receive high volumes of sediments. Over time any buildup of fines that impact the stone surface absorption capacity will be removed and replaced.

Reservoir Course:

The reservoir course will consist of clean double washed 3/4" stone free of debris. The stone depth will be 3" to 6" typically.

Pretreatment Layer

A pretreatment layer will be achieved by providing an 8-12" subbase gravel layer (MDOT Type D) beneath the crushed stone.

Separation to Groundwater:

Based on the test pit data included in previous subsurface explorations, the groundwater table throughout the site is six to nine feet below existing grade.

Infiltration Testing:

The applicant is seeking a waiver from the infiltration testing requirement. The applicant has observed the existing site after heavy rain events and observed ponding for only a couple of hours. The existing site has a surface gravel/sand layer and it is expected that the proposed stone surface will not negatively impact the infiltration properties below.

Flooding Standard:

Due to the direct discharge to the Fore River, **a waiver from the flooding standard is being requested**. All overflow pipes and structures will be sized to adequately convey the 25yr storm event.

Storm events larger than the 1 inch storm will be directed via sheet flow to one of the following:

- The street side parcel north of the new tracks will be conveyed to several inlets that will connect to the CSO lines for discharge to the Fore River.
- The shorefront parcel will generally generate overland flow to the waterfront and the river.

10.0 CHAPTER 500 TREATMENT PERCENT COMPLIANCE

The proposed redevelopment project creates 0.8 acres of improved surface area (pavement and roof) and 10.2 acres of pervious boat yard surface area for a total disturbed area of about 11 acres. An additional 1.7 acres will remain as is or contain new landscaping coverage.

Of the 0.8 acres of improved surface area, the proposed stormwater management plan provides treatment for 0.69 acres or 86 percent. Of the 10.2

acres of pervious boatyard surface, nearly all of that area is considered treated thereby yielding 10.89 acres treated area out of the 11 acres of disturbance for a treatment percentage of 99 percent. The total disturbed area as part of this redevelopment is approximately 11 acres. Hence, the strategies proposed herein meets the minimum requirements stated in the General Standards.

11.0 BOATYARD ACTIVITY PLANNING

A major issue associated with boatyard and marine related use is the proximity to the shorefront. Any pollutants that are generated on the site may eventually reach the water. As such, the applicant will implement thoughtful planning and processes to avoid toxic pollutants including organic chemicals and heavy metals from spills.

Activities such as hull prep, sandblasting, painting, washing, engine repairs and maintenance will be performed in accordance with the guidelines set forth in the Brightworks manual. Storage, handling and disposal of waste material from these activities will also be carried out in accordance with the manual and utilize local waste companies who specialize in this environment. A plan will also be in place to manage spills if and when they occur. This plan will identify potential spill sources, hazardous materials stored, prevention measures (including training, security, etc.), spill emergency procedures (including health and safety measures, notification information, spill containment, etc.), emergency phone numbers, location of spill containment and control materials and a drainage plan. The applicant is a current boatyard operator and is very familiar with the guidelines and requirements set forth in the Brightwork Manual. They have successfully complied with these requirements for many years and they are confident that similar operations will be maintained at the proposed site.

12.0 EROSION CONTROL

An Erosion Control Narrative, Plan, and Details have been previously prepared for the project and are part of the project record. These materials continue to apply as they relate to the Phase III construction activities.

13.0 OPERATIONS AND MAINTENANCE

An Operations & Maintenance Manual has been previously prepared and is part of the project record. The requirements of this O&M Manual continue to apply to this Phase III project.

14.0 PERMIT REQUIREMENTS

City of Portland review and permitting of the Stormwater Management Plan is required and will be completed with the review of the Site Plan Application submitted to the City of Portland Planning Authority.

ATTACHMENT B

EROSION & SEDIMENTATION CONTROL REPORT

EROSION AND SEDIMENTATION CONTROL REPORT

CANAL LANDING NEW YARD
100 WEST COMMERCIAL STREET
PORTLAND, ME

PREPARED FOR

NEW YARD, LLC
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PORTLAND, MAINE 04101
(207) 774-1067

PREPARED BY

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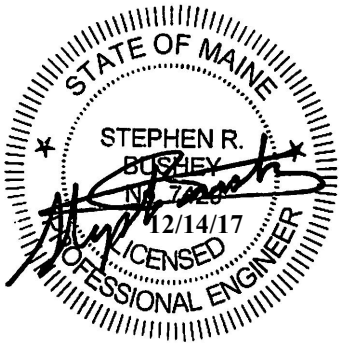

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A. INTRODUCTION

Canal Landing, LLC proposes to construct, own, and operate a new boat maintenance and repair yard within approximately 17 acres of land located prominently along the West Commercial Street waterfront. The project represents an ideal reuse of a former highly industrialized property that over the years has been relatively inactive. The property maintained a prominent role in the City's Waterfront District for well over a century and a half as the Maine Central Railroad operated active business interests up until at least the 1970's.

The proposed project includes multiple buildings to be constructed over multiple phases along with new shorefront uses including one or more boat ramps, docks, new or reconstructed piers and a travel lift basin. The applicant's plans include up to three buildings constructed to support the boat maintenance and repair operations. Additional future buildings are also contemplated to support marine related operations including retail/warehouse space, yacht brokerage/sales, marine product processing and the potential of large vessel berthing. The applicant is currently seeking Phase III approval for the construction of a single building, related yard improvements, boat ramps, and surface stabilization.

The project includes site development activities involving earthwork, grading, shorefront stabilization, pier rehabilitation, boat ramps, building construction, utilities and overall site stabilization. This work will be completed cooperatively with the landowners, and in accordance with site remedial activities.

This section of the permit application presents the Erosion Sediment Control Plan designed for the project. The erosion control plans will be contained in the contract documents for implementation by the Contractor who is awarded the bid for the project. Similarly, the applicant's own work force will also comply with these requirements. The construction of the project will be phased. This project is coordinated with the MeDEP erosion control requirements. The fugitive dust emissions will be controlled, the requirements of this erosion control plan, and all permit requirements will be fulfilled. Winter construction will be required. Specific erosion controls stipulated by the plan and this report are minimum requirements.

B. EXISTING CONDITIONS

The site consists of approximately 17.77 acres of land that is composed of three primary areas described as follows:

1. **Retained Parcel (Map 59A, Lots 3 & 4)**: Consists of the retained 5.03-acre area owned by New Yard, LLC and it represents the retained land originally permitted by the Applicant during late 2012 – 2013. Within this land area New Yard, LLC has constructed Building A and Building B amounting to approximately 48,000 SF of building space. This parcel contains a new boat ramp and boat yard area currently in use by Portland Yacht Services.
2. **Shorefront Parcel (Map 60F, Lots 3 & 4)**: This area is irregularly shaped and contains approximately 1,581 LF of waterfront. The site area is approximately 5.99 acres. This area is currently undeveloped except for the granite revetment wall that historically supported the former waterfront pier.
3. **Street Front Parcel (Map 60F, Lot 1)**: This 6.75-acre area contains approximately 2,160 LF of street front. The property is generally unoccupied although there are existing rail tracks that previously provided access to the former NGL Distribution facility within what will be IMT expansion area in the future. Towards the east end of this parcel, historic land use has included parking of vehicles, trailers and similar activities associated with businesses further east on Commercial Street. Most of this use was unauthorized by the previous landowner, Portland Terminal Co.

Existing development in the area includes the following:

- The City of Portland Marine Terminal and expansion area is located to the east of the site.
- Commercial activity including Nova Seafood and Graybar Electric operate out of buildings on the north side of Commercial Street.
- The Portland Star Match Co. building lines up opposite the site.
- The State of Maine now operates rail tracks into the propane storage yard and IMT expansion area. These tracks were completed very recently.

Owen Haskell, Inc. has completed a topographic survey of the property. The site is relatively flat with the highest points along the Commercial Street frontage, sloping to the middle of the site. Site elevations along Commercial Street trend down from west to east from elevation 18' (NGVD 1929) to elevation 15'. The site's low areas are near elevation 9'-10' while most of the waterfront top of bank is near elevation 12'. The High Annual Tide Line (HAT) for the Fore River is elevation 7.4' and mean low water is approximately elevation -4.0'. Owen Haskell, Inc. has also completed bathymetric survey data collection and found water depths within 50' of the low water line to be 10' to 30'. The Federal Channel is also represented on the project's preliminary drawings and it is generally located 60' to 120' off the shorefront. No activities are proposed beyond the Federal Channel line.

Generally speaking, the site's runoff infiltrates into the ground or drains directly to the Fore River via overland flow. There are no drainage systems on site, although there is a closed storm drainage system within Commercial Street. The Commercial Street drainage system ultimately ties into either of the two existing CSO lines that discharge to the river.

Due to the site's historic industrial condition much of the surface consists of sand and gravel fill, asphalt or otherwise sparsely vegetated ground surface.

The site's soil layers are generally characterized as follows:

- 10 to 15 feet of sand and gravel fill – there is little to no organic surface layer throughout the site.
- 5 to 10 feet of silt and sand.
- 10 to 40 feet of gray clay identified as the Presumpscot formation.
- 30 to 40 feet of dense silty marine sands.
- An undetermined thickness of dense silty sand and gravel identified as glacial till overlaying bedrock.

Observed soils conditions at the ground surface include fill material containing coal, coal ash, and comingled with scarified sand and gravel. Minor eroded soils conditions have been observed along the shoreline in and behind the existing granite revetment wall and remnant pier areas. The project's site development activities include restoration, rehabilitation, and stabilization of these areas.

According to various investigation data, depth to groundwater varies from 3 to 7 feet and this likely varies with tidal conditions in the Fore River. Generally speaking, the groundwater flows from the northwest to the southeast across the site.

C. PROPOSED PROJECT

The applicant proposes to redevelop the property in a manner consistent with the WPDZ Standards as well as any applicable VRAP requirements. The development program includes the following components:

ONSITE

The development program includes continued phased development of boat maintenance facilities and ancillary marine related uses. Phase III and future Concept Plan development activities are summarized as follows:

Phase III – Will Include (For Which Approval Renewal Is Requested):

- Site clearing, stabilization, and general clean-up.
- Construction of a 19,800 SF footprint individual metal building for marine retail and boat maintenance operations (building C). (This requires a Conditional Use Approval).
- Establishment of yard areas and surfaces for heavy equipment, and boat display, storage or repair. (Repair and maintenance often takes place outside, particularly if the vessel is large and does not fit into a building. Boats that are out of the water for the winter season all need to have work done on them to prepare them for re-launching.)
- Installation of utilities for building use as well as future phase activities.
- A 20' x 120' storage building along the waterfront is proposed for storage of racing shells.
- Temporary facilities including one or more portable trailers and storage buildings for sailboat masts and related boat equipment.
- A 60’ x 80’ steel framed multi story structure is proposed as an office space for Portland Yacht Services (Building D).
- A 2 to 3 acre area on the west end of the street front parcel is proposed for use as a marine cargo related stack/storage yard. The applicant is seeking to construct a basic yard area with security fence/access for use by various marine operations on the waterfront. This may include use by the IMT, BIW, Sprague or other users for short term parking, storage or related operations. This is an unfilled need for this type of area on the waterfront which New Yard is seeking to address, based on interest by various third parties to the applicant.
- The site’s existing topography reduces the need for substantial earthwork and the primary emphasis is on the placement of new aggregate and stone surfacing, thus minimizing the potential for significant erosion or sediment transport.

D. OVERVIEW OF SOIL EROSION AND SEDIMENTATION CONCERNS

The primary emphasis of the Erosion and Sedimentation Control Plan to be implemented for this project is as follows:

- **Temporary Measures:** Planning the project to have erosion resistant measures in place by implementing measures intended to prevent erosion from occurring.
- **Phasing Sequencing:** The plan includes measures to intercept and convey runoff to temporary sediment sumps as the construction of the project occurs. The use of small temporary

collection sumps with a clean sand or crushed stone filter above an underdrained discharge is recommended to supplement the principal sumps to help reduce turbidity.

- **Crushed stone surfacing:** The applicant has placed heavy emphasis on the placement of crushed stone over the majority of the site to create a stable surface that aids with water absorption and minimizes erosion potential.
- **Use of Type 1 Settling:** Installing sediment sumps and swales early in the construction sequence to provide secondary relief for erosion control measures within the site until late in the project when the sedimentation areas need to be removed for final restoration.
- **Restabilization:** Stabilization of areas denuded to underlying parent material must occur within stipulated time frame to minimize the period of soil exposure and stabilization of drainage paths to avoid rill and gully erosion.
- **Interim Entrapment:** The use of on-site measures to capture sediment (hay bales/silt fence/erosion control mix barriers, etc.) before it is conveyed to sediment sumps or collection inlets.
- **Long Term Site Protection:** The implementation of long-term measures for erosion/sediment and pollutant treatment through the construction of permanent water quality measures including the principal measures of aggregate and crushed stone surfacing over the majority of the site
- **Shore side protection:** Involves the placement of floating booms/turbidity curtains along the waterfront during work on the revetments, travel lift basin, and float installations.
- **Special Winter Construction Measures:** These will be required for work between September 15 and April 15.

E. DESCRIPTION AND LOCATION OF LIMITS OF ALL PROPOSED EARTH MOVEMENTS

The construction of the project will disturb about 7 acres of land. The limit of disturbance is generally coincident with the limit of grading. Most of the disturbance however involves fill placement rather than earthmoving, this reducing the potential for erosion.

The earth moving will include trenching for underground utilities, earthwork to reshape the site and construct trenches along the easterly edge, earthwork to prepare and shape the prepared boatyard surface, and excavation attendant with the building foundations and excavation and borrow for the project improvements.

F. CRITICAL AREAS

Critical resource areas include the Fore River and associated shoreline stabilization. No special species habitats have been identified. It is noted that stormwater system consisting of infiltration through the proposed prepared boatyard stone surface shall not be activated until the tributary areas have been stabilized.

G. EROSION/SEDIMENTATION CONTROL DEVICES

As part of the site development, the Contractor will be obligated to implement the following erosion and sediment control devices. These devices shall be installed as indicated on the plans or as described within this report. For further reference on these devices, see the *Maine Department of Environmental Protection Erosion and Sediment Control BMPS Manual (March, 2003)*.

1. Siltation barrier shall be installed down slope of any disturbed areas to trap runoff borne sediments until the site is revegetated. The silt barrier shall be installed per the detail provided in the plan set and inspected immediately after each rainfall and at least daily during prolonged rainfall. The Contractor shall make repairs immediately if there are any signs of erosion or sedimentation below the barrier line. If such erosion is observed, the Contractor shall take proactive action to identify the cause of the erosion and take action to avoid its reoccurrence. Typically, this requires that stabilization measures be undertaken. Proper placement of stakes and keying the bottom of the silt barrier fabric into the ground is critical to the barrier's effectiveness. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind the barrier, the barrier shall be replaced with a stone check dam and measures taken to avoid the concentration of flows not directed to the silt barrier.

2. Silt barrier is shown by three types, depending upon the timing and intent, as follows:

SCHEDULE OF SILT BARRIER REQUIREMENTS		
Silt Barrier	**Type/Purpose**	**Time of Installation**
Condition 1	To trap sediment along the grading edge where the new contours nearly parallel existing contours.	At initial site preparation, prior to other work.
Condition 2	To trap sediment from the work area; install in short sections parallel to existing contour; typically occurs where proposed and existing contours form a "V" shape.	At initial site preparation, prior to other work. On occasion, this needs to be deferred until the area for the silt barrier installation can be reached.
Condition 3	To trap sediment along the base of proposed contours, typically in cut areas.	During construction after new grade is shaped. Time between work in area and shaping new grade to allow silt barrier to be installed shall be minimized.

Conditions 2 and 3 silt barrier may be used between project phases. In the event of frozen ground where silt barrier cannot be installed, a wood waste (erosion control mix) berm may be used as a substitute.

3. Straw or hay mulch including hydroseeding is intended to provide cover for denuded or seeded areas until revegetation is established. Mulching should be occurring several times per week when the site construction activity is high and at sufficient intervals to reduce the period of exposure of bare soils to the time limits set forth in this plan. Mulch placed on slopes of less than 10 percent shall be anchored by applying water; mulch placed on slopes steeper than 10 percent shall be covered with fabric netting as immediately after mulching as practicable and anchored with staples in accordance with the manufacturer's recommendations. Proposed drainage channels, which are to be revegetated, shall receive Curlex blankets by American Green selected for the slope, velocity, and whether the measure is temporary or intended to be in place for a sustained period. Mulch application rates are provided in Appendix A of this section. Hay mulch shall be available on site at all times in order to provide immediate temporary stabilization when necessary. Temporary sediment sumps will provide sedimentation control for stormwater runoff from disturbed areas during construction until stabilization has been achieved. The sediment sumps need to include a sand filter above an underdrain.

4. A construction entrance will be constructed at all access points onto the site to prevent tracking of soil onto adjacent local roads and streets. Routine pavement sweeping will be necessary during construction and as part of regular operations.

5. Stone sediment traps or a premanufactured SiltSack™ and a sediment bag will be installed at catch basin inlets to prevent silt from entering the storm drain system. Installation details are provided in the plan set on the erosion control detail sheets.

6. Dirtbags™ will be required to be on site and available for construction dewatering related to trenching or foundation construction. Dirtbags™ will need to be installed above filter sand and crushed stone in accordance with the details shown on the plan set will need to be installed.

7. Loam and seed is intended to serve as the secondary permanent revegetative measure for all denuded areas not provided with other erosion control measures, such as riprap or manmade pervious surface. Application rates are provided in Appendix A of this section for temporary and permanent seeding. It is anticipated there will be a limited area of grass establishment beyond what currently exists based on the project's needs for boat storage and the placement of the boatyard surface over the majority of the site.

8. Stone check dams will be installed in areas noted on the plan or as warranted, based upon observations during construction of the site.

9. Silt logs are an option for stone check dams and may be substituted provided the devices are well anchored.

H. TEMPORARY EROSION/SEDIMENTATION CONTROL MEASURES

The following are planned as temporary erosion/sedimentation control measures during construction:

1. Crushed stone-stabilized construction entrances shall be placed at any construction access points from adjacent streets or the existing parking lot. The locations of the construction entrances shown on the drawings should be considered illustrative and will need to be adjusted as appropriate and located at any area where there is the potential for tracking of mud and debris onto existing roads or streets. Stone stabilized construction entrances will require the stone to be removed and replaced, as it becomes covered or filled with mud and material tracked by vehicles exiting the site. The applicant has maintained crushed stone surfaces over much of the site over the past few years and found it to be a successful approach to surface management, erosion and runoff control.

2. Silt barrier shall be installed along the downgradient side of the proposed improvement areas. The silt barrier will remain in place and properly maintained until the site is acceptably re-vegetated. Silt barrier needs to be checked to insure the bottom is properly keyed in and inspected after significant rains. Wood chips or Erosion Control Mix is often used on the construction side of the silt barrier to provide an extra margin of safety and security for the silt barrier. This practice is encouraged, provided the chips are removed when the barrier is removed.

3. Dirtbags™ shall be used in accordance with the details in the plan set. The purpose of the Dirtbags™ is to receive any water pumped from excavations during construction. A Dirtbag™ shall be installed and prepared for operation prior to any trenching on site. When Dirtbags™ are observed to be at 50% capacity, they shall be cleaned or replaced. Stone and filter sand under the Dirtbag™ shall be removed and replaced concurrently with the replacement of the Dirtbag™.

4. Temporary stockpiles of common excavation will be protected as follows:

   a) Temporary stockpiles shall not be located at least 50 feet upgradient of the perimeter silt barrier.

   b) Inactive stockpiles shall be stabilized within 5 days by either temporarily seeding the stockpile with a hydroseed method containing an emulsified mulch tackifier or by covering the stockpile with mulch. If necessary, mesh shall be installed to prevent wind from removing the mulch.

5. All denuded areas except gravel areas shall receive mulch, erosion control mesh fabric, or other approved temporary erosion sediment measure within 7 days of initial disturbance of soil or before a predicted rain event of >1/2" unless permanent measures are installed.

6. All soils disturbed between September 15 and April 15 will be covered with mulch within 5 days of disturbance, prior to any predicted storm event of the equivalent of ½" of rainfall in a 24-hour period, or prior to any work shutdown lasting more than 35 hours (including weekends and holidays). The mulch rate shall be double the normal rate.

   For work that is conducted between September 15 and April 15 of any calendar year, all denuded areas will be covered with hay mulch, applied at twice the normal application rate, and (in areas over 10% grade) anchored with a fabric netting. The time period for applying mulch shall be limited to 5 days for all areas, or immediately in advance of a predicted rainfall event.

7. Stone check dams, silt logs, or hay bale barriers will be installed at any evident concentrated flow discharge points during construction and earthwork operations.

8. Silt fencing with a maximum stake spacing of 6 feet should be used, unless the fence is supported by wire fence reinforcement of minimum 14 gauge and with a maximum mesh spacing of 6 inches, in which case stakes may be spaced a maximum of 10 feet apart. The bottom of the fence should be properly anchored a minimum of 6" per the plan detail and backfilled. Any silt fence identified by the owner or reviewing agencies as not being properly installed during construction shall be immediately repaired in accordance with the installation details.

9. Storm drain catch basin inlet protection shall be provided through the use of stone sediment barriers or a premanufactured SiltSack™. Stone sediment barrier installation details are provided in the plan set. The barriers or SiltSacks™ shall be inspected after each rainfall and repairs made as necessary, including the removal of sediment. Sediment shall be removed and the barrier or SiltSack™ restored to its original dimensions when the sediment has accumulated to one-half the design depth of the barrier. Sediment shall be removed from SiltSacks™ as necessary. Inlet protection shall be removed when the tributary drainage area has been stabilized.

10. All slopes steeper than 4:1 shall receive erosion control mesh.

11. Areas of visible erosion and the temporary sediment sumps shall be stabilized with crushed stone. The size of the stone shall be determined by the contractor's designated representative in consultation with the Owner.

12. Any flow from the site that is concentrated must be directed to a sump with sand filter and underdrained discharge.

13. Concentrated runoff shall be diverted away from slopes of over 10 percent unless the slope is armored with stone.

14. Underground utilities must be installed in compliance with the following standards and other requirements of this erosion control plan:

- No more than 500 linear feet of trench may be opened at one time;
- Excavated materials shall be placed on the uphill side of trenches;
- Dewatering of the trench shall be pumped through a Dirtbag™ and appropriate sediment control facilities to avoid a turbid discharge; and
- Stabilization shall occur as soon as practicable.

15. Rice straw wattles shall be used to control localized erosion.
16. Maintenance of the erosion control, sedimentation facilities, and control of fugitive dust must occur until the site is stabilized with permanent erosion control measures.

I. STANDARDS FOR STABILIZING SITES FOR THE WINTER

The construction of the project may require winter construction. The project is anticipated to require about 6 months to construct. For permitted winter construction, the erosion control measures are substantially more stringent due to the cold temperatures and lack of weather conditions which aid in drying the subgrade soils through evaporation.

If construction activities involving earth disturbance continue past September 15 or begin before April 15, the following must be incorporated with the erosion control plan and implementation:

1. Enlarged access points must be stabilized to provide for snow stockpiling.
2. Limits of disturbance shall be reduced to the extent practicable.
3. A snow management plan including adequate storage and control of snowmelt, requiring cleared snow to be stored downgradient of all areas of disturbance shall be prepared by the contractor and submitted to the Owner for review and approval.
4. Snow shall not be stored in sediment basins or to preclude drainage structures from operating as intended.
5. A minimum 25-foot buffer maintained from perimeter controls such as silt fence shall be maintained on the "work area side" to allow for snow clearing and maintenance.
6. Drainage systems intended to operate during the winter shall be catalogued, shown on a plan, and inspected after each snow removal period to make sure the drainage structures are open and free of snow and ice dams.
7. To ensure cover of disturbed soil in advance of a melt event, areas of disturbed soil must be stabilized at the end of each work day, with the following exceptions:
   - If no precipitation within 24 hours is forecast and work will resume in the same disturbed area within 24 hours, daily stabilization is not necessary.
   - Disturbed areas that collect and retain runoff, such as house foundations or open utility trenches.
8. Standard for the timely stabilization of ditches and channels: The Contractor shall construct and stabilize all stone-lined ditches and channels on the site by September 15. The contractor shall construct and stabilize all grass-lined ditches and channels on the site by September 1. If the Contractor fails to stabilize a ditch or channel to be grass-lined by September 1, then the Contractor shall take one of the following actions to stabilize the ditch for late fall and winter.
   i. Install a sod lining in the ditch. The contractor shall line the ditch with properly installed sod by September 15. Proper installation includes the applicant pinning the sod onto the

soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, watering the sod to promote root growth into the disturbed soil, and anchoring the sod with jute or plastic mesh to prevent the sod strips from sloughing during flow conditions.

ii. Install a stone lining in the ditch. The contractor shall line the ditch with stone riprap by September 15. The contractor shall hire a registered professional engineer to determine the stone size and lining thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the Contractor shall regrade the ditch prior to placing the stone lining so as to prevent the stone lining from reducing the ditch's cross-sectional area.

9. Standard for the timely stabilization of disturbed slopes: The Contractor shall construct and stabilize stone-covered slopes by September 15. The Contractor shall seed and mulch all slopes to be vegetated by September 1. The Department will consider any area having a grade greater than 15% (10H:1V) to be a slope. If the Contractor fails to stabilize any slope to be vegetated by September 1, then the Contractor shall take one of the following actions to stabilize the slope for late fall and winter.

   i. Stabilize the soil with temporary vegetation and erosion control mesh. By September 15, the Contractor shall seed the disturbed slope with winter rye at a seeding rate of 3 pounds per 1,000 square feet and apply erosion control mats over the mulched slope. The contractor shall monitor growth of the rye over the next 30 days. If the rye fails to grow at least three inches or fails to cover at least 75% of the disturbed slope by September 15, then the Contractor shall cover the slope with a layer of wood waste compost as described in item iii of this standard or with stone rip rap as described in item iv of this standard.

   ii. Stabilize the slope with sod. The Contractor shall stabilize the disturbed slope with properly installed sod by September 15. Proper installation includes the Contractor pinning the sod onto the slope with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. The Contractor shall not use late-season sod installation to stabilize slopes having a grade greater than 33% (3H:1V) or having groundwater seeps on the slope face.

   iii. Stabilize the slope with wood waste compost. The Contractor shall place a six-inch layer of wood waste compost on the slope by September 15. Prior to placing the wood waste compost, the Contractor shall remove any snow accumulation on the disturbed slope. The contractor shall not use wood waste compost to stabilize slopes having grades greater than 50% (2H:1V) or having groundwater seeps on the slope face.

   iv. Stabilize the slope with stone rip rap. The Contractor shall place a layer of stone riprap on the slope by September 15. The Contractor shall hire a registered professional engineer to determine the stone size needed for stability and to design a filter layer for underneath the riprap.

10. Standard for the timely stabilization of disturbed soil: By September 1, the Contractor shall seed and mulch all disturbed soils on areas having a slope less than 15%. If the Contractor fails to stabilize these soils by this date, then the Contractor shall take one of the following actions to stabilize the soil for late fall and winter.

    i. Stabilize the soil with temporary vegetation. By September 15, the Contractor shall seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1,000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1,000 square feet, and anchor the mulch with plastic netting. The Contractor shall monitor the growth of the rye

over the next 30 days. If the rye fails to grow at least three inches or fails to cover at least 75% of the disturbed soil before September 15, then the Contractor shall mulch the area for over-winter protection as described in item iii of this standard.

ii. Stabilize the soil with sod. The Contractor shall stabilize the disturbed soil with properly installed sod by September 15. Proper installation includes the Contractor pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.

iii. Stabilize the soil with mulch. By September 15, the Contractor shall mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1,000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, the Contractor shall remove any snow accumulation on the disturbed area. Immediately after applying the mulch, the Contractor shall anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

iv. Stabilize all stockpiles with mulch within 24 hours.

J. SPECIAL MEASURES FOR SUMMER CONSTRUCTION

The summer period is generally optimum for construction in Maine, but it is also the period when intense short duration storms are most common, making denuded areas very susceptible to erosion, when dust control needs to be the most stringent, and when the potential to establish vegetation is often restricted by moisture deficit. During these periods, the Contractor must:

1. Implement a program to apply dust control measures on a daily basis except those days where the precipitation exceeds 0.25 inch. This program shall extend to and include adjacent streets used by construction vehicles.

2. Spray any mulches with water after anchoring to dampen the soil and encourage early growth. Spraying may be required several times. Temporary seed may be required until the late summer seeding season.

3. Mulch, cover, and moisten stockpiles of fine-grained materials, which are susceptible to erosion. In the summer months, the potential for wind erosion is of concern, as well as erosion from the intense, short-duration storms, which are more prevalent in the summer months.

4. Take additional steps needed to control fugitive dust emissions to minimize reductions in visibility and the airborne disbursement of fine-grained soils. This is particularly important along the adjacent streets.

These measures may also be required in the spring and fall during the drier periods of these seasons.

K. PERMANENT EROSION CONTROL MEASURES

The following permanent erosion control measures have been designed as part of the Erosion/Sedimentation Control Plan:

1. The drainage conveyance systems have been designed to intercept and convey the 25-year storm.

2. All areas disturbed during construction, but not subject to other restoration (paving, crushed stone surface, etc.), will be loamed, limed, fertilized, mulched, and seeded. Fabric netting, anchored with staples, shall be placed over the mulch in areas where the finish grade slope is greater than 10 percent. Native topsoil shall be stockpiled and temporarily stabilized with seed and mulch and reused for final restoration when it is of sufficient quality. The area of permanent grass coverage for the site is very limited.

3. Catch basins shall be provided with 2' sediment sumps for all outlet pipes that are 12" in diameter or greater.

4. Permanent seeding shall be conducted only in April through May and in late summer until September 15.

5. Boatyard gravel/stone surface will be applied to the majority of the site.

L. TIMING AND SEQUENCE OF EROSION/SEDIMENTATION CONTROL MEASURES

The site is quite stable and is principally a semi-vegetated gravel surface. These conditions will reduce the extent of erosion controls needed compared to projects with fine-grained soils. However, the project will be phased and the Contractor must control fugitive dust emissions, respect and not impede the neighboring land uses, and control sediment laden runoff. For all grading activities, the Contractor shall exercise extreme caution not to overexpose the site by limiting the disturbed area and shall stabilize any steep slopes within 24 hours if final slope grading and stabilization will not be completed within 7 days. Any final slopes shall have the specified erosion control measures installed within 7 days of final stabilization.

The following construction sequence shall be required, (unless otherwise authorized in writing by the Owner's project manager or authorized permit agent).

The description of the work is:

Phase III: The Contractor will need to perform the following work:

- Mark the Phase III work limits.
- Install safety fence and security signs around the perimeter of the site.
- Establish and install construction entrance with gates.
- Install silt fence or barriers along the perimeter and other designated areas requiring Condition 1 silt barrier.
- Install silt sacks and inlet protection at existing structures on Commercial Street.
- Initialize removal of items slated for demolition and removals.
- Establish Dirtbag™ area and pump system for dewatering activities as necessary.
- Construct a diversion swale to direct as much of the site to the temporary sedimentation swales as possible including the installation of culverts and rip rap where the diversion swale passes under the construction access drives.
- Commence earthwork activity to shape prepared boatyard surface.
- Construct the Phase III Building and connect associated utilities.
- Trench across site to connect utilities to shorefront elements.

- Install landscaping around the perimeter site.
- Place boatyard prepared stone surfaces.

M. CONTRACTING PROCEDURE

The onsite components of the project will be constructed by a General Contractor under contract to the applicant. The Contractor shall submit a schedule for the completion of the work, which will satisfy the following criteria:

1. The construction sequence of Section L should generally be completed in the specified order; however, several separate items may be constructed simultaneously. Work must also be scheduled or phased to prevent the duration of areas exposed or susceptible to erosion as specified below. The intent of this sequence is to provide for erosion control and to have structural measures such as silt barriers and construction entrances in place before large areas of land are denuded.

2. The work shall be conducted in sections which will:

   a) Limit the amount of exposed area to those areas in which work is expected to be undertaken during the preceding 30 days.

   b) Revegetate disturbed areas as rapidly as possible. All areas shall be permanently stabilized within 7 days of final grading and temporarily stabilized within 7 days of initial disturbance or before a predicted storm event of over ½" of rain.

   c) Incorporate planned inlets and drainage system as early as possible into the construction phase. The ditches shall be immediately lined or revegetated as soon as their installation is complete.

3. Once final grade has been established, the Contractor may choose to dormant seed the disturbed areas prior to placement of mulch and placement of fabric netting anchored with staples.

   a) If dormant seeding is used for the site, all disturbed areas shall receive 6" of loam and seed at an application rate of 5#/1,000 s.f.

      All areas seeded during the winter months will be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 75 percent catch) shall be revegetated by replacing loam, seed, and mulch.

   b) If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.

4. The area of denuded, non-stabilized construction shall be limited to the minimum area practicable. An area shall be considered to be denuded until the subbase gravel is installed in parking areas, or the areas of future loam and seed have been loamed, seeded, and mulched. The mulch rate shall be twice the rate specified in the seeding plan. [For example, 115#/1,000 s.f. x 2 = 230#/s.f.]

5. Within the exposed work area, temporary sedimentation sumps shall be provided in any concentrated flow area with a sand filter or chemical coagulation. Additional information is provided in prior sections of this narrative and on the Erosion Control Details of the plan set. Along the sedimentation sumps, barriers shall be provided at sufficient intervals to permit runoff to be accumulated to a minimum depth of 12" before overflowing.

6. The schedule shall be subject to the approval of the Owner.

7. The Contractor must maintain an accurate set of record drawings indicating the date when an area is first denuded, the date of temporary stabilization, and the date of final stabilization.

8. The Contractor must install any added measures which may be necessary to control erosion/sedimentation and fugitive dust emissions from the site, with adjustments made dependent upon forecasted and actual site and weather conditions.

9. The Contractor shall note that no area within 50 feet of a slope with a vertical drop of more than 3' in 50 feet shall remain denuded for a period of over 5 days before it is temporarily stabilized. Temporary stabilization shall be the installation of mulching. All other areas shall be stabilized within 7 days or before a predicted rain event. For construction between September 15 and April 15 of any calendar year, all areas shall be temporarily stabilized at the earlier time frames specified above.

   A notice and point of contact with cell phone number shall be posted at the trailer to permit access to the records during normal work hours and in case of emergency at other times. All additions and construction records shall be copied via e-mail to the following addresses:

   phin@portlandyacht.com

   The Owner reserves the right to add additional personnel to this list at the pre-construction conference or at reasonable intervals during the project.

10. The Owner will provide a copy of the Notice of Intent acceptance letter to the Contractor. This letter shall be maintained at the site.

11. The Contractor shall engage a qualified representative to monitor the work. This representative shall be approved by the Owner prior to the individual being engaged on the project. This inspection shall be a part of the Contractor's Quality Control Plan for the project by the Contractor. The representative's qualifications and duties that he shall perform are as follows:

    a. Licensed Professional Engineer or Certified Professional in Erosion Control`

    b. Covered by Workman's Compensation Insurance

    c. Experienced in this type of work, the specific erosion controls applicable to this project with a resume approved by the engineer

    d. Compensated on a unit rate basis with no incentives for reduced costs or subject to any type of compensation for passing inspections

    e. Approved by the Owner and the preparer of this plan

    The *qualified representatives* shall conduct site inspections in accordance with the following timetable:

    a. Where soil disturbance activities are on-going, the *qualified representative* shall conduct a site inspection at least once every seven (7) calendar days.

b. Where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified representative* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the City's stormwater contact person or, in areas under the jurisdiction of a *regulated traditional land use control MS4*, the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections.

c. Where soil disturbance activities have been shut down with partial project completion, the *qualified representative* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed and are operational. The *owner or operator* shall notify the City's stormwater contact person in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the Contractor shall have the *qualified representative* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, and all temporary, structural erosion and sediment control measures have been removed, and that all post-construction stormwater management practices have been constructed in conformance this plan by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the Notice of Termination. The *owner or operator* shall then submit the completed Notice of Termination form to the City of Portland.

At a minimum, the *qualified representative* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of discharge to natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

The *qualified representative* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

a. Date and time of inspection;

b. Name and title of person(s) performing inspection;

c. A description of the weather which shall be consistent with the National Weather Service Forecast Office, Portland-Gray, ME and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

d. A description of the condition of the runoff at all points of discharge from the construction site and sampling to determine the turbidity in NTU's. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

e. A description of the condition of all natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site which received runoff from disturbed areas. This shall include identification of any *discharge* of sediment to the surface water body;

f. Identification of all erosion and sediment control practices that need repair or maintenance;

g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified representative* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified representative* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified representative* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

Within one business day of the completion of an inspection, the *qualified representative* shall notify the owner the appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame, at its sole cost.

All inspection reports shall be signed by the *qualified representative*. The inspection reports shall be maintained on site.

12. The Owner reserves the right to have quality assurance monitoring of the work. The Contractor shall, at its sole cost, cooperate with the Owner and their quality assurance monitoring of the work including maintaining an accurate schedule for performing the work. The Owner will notify the contractor if any particular elements of the work should be uncovered or available for observation by the Quality Assurance Monitor selected by the Owner. The Owner reserves the right to conduct the quality assurance monitoring during working hours at any time during the project.

N. PROVISIONS FOR MAINTENANCE OF THE EROSION/SEDIMENTATION CONTROL FEATURES

The project will be contracted to a General Contractor. The project is subject to the requirements of the local permits, and a state regulated Construction General Permit and Site Location of Development Permit (administered by the City of Portland).

This project requires the Contractor to prepare a list and designate by name, address and telephone number all individuals who will be responsible for implementation, inspection, and maintenance of all erosion control measures identified within this section and as contained in the Erosion and Sedimentation Control Plan of the contract drawings. Specific responsibilities of the qualified representative(s) will include:

1. Execution of the Contractor/Subcontractor Certification contained in Appendix B by any and all parties responsible for erosion control measures on the site as required by the permit authorities.

2. Assuring and certifying the Owner's construction sequence is in conformance with the specified schedule of this section. A weekly certification stating compliance, any deviations, and corrective measures necessary to comply with the erosion control requirements of this section shall be prepared and signed by the qualified representative(s).

3. In addition to the weekly certifications, the representative(s) shall maintain written reports recording construction activities on site which include:

    - Dates when major grading activities occur in a particular areas.
    - Dates when major construction activities cease in a particular area, either temporarily or permanently.
    - Dates when an area is stabilized.

4. Inspection of this project work site on a weekly basis and after each significant rainfall event (0.5 inch or more within any consecutive 24-hour period) during construction until permanent erosion control measures have been properly installed and the site has been stabilized. Inspection of the project work site shall include:

    - Identification of proper erosion control measure installation in accordance with the erosion control detail sheet or as specified in this section.
    - Determine whether each erosion control measure is properly operating. If not, identify damage to the control device and determine remedial measures.
    - Identify areas which appear vulnerable to erosion and determine additional erosion control measures which should be used to improve conditions.
    - Inspect areas of recent seeding to determine percent catch of grass. A minimum catch of 90 percent is required prior to removal of erosion control measures.
    - All erosion controls shall be removed within 30 days of permanent stabilization except for mulch and netting not detrimental to the project. Removals shall include but not be limited to all silt fence or barrier, hay bales, inlet protection, and stone check dams.
    - Accumulated silt/sediment should be removed when the depth of sediment reaches 50 percent of the barrier height. Accumulated silt/sediment should be removed from behind silt fencing when the depth of the sediment reaches 6 inches.
    - Silt sacks should be removed and replaced at least every three months and at any time where the weekly inspection reveals that siltation has significantly retarded the rate of flow through the silt sack.

5. If inspection of the site indicates a change should be made to the erosion control plan, to either improve effectiveness or correct a site-specific deficiency, the representative shall immediately implement the corrective measure and notify the Owner of the change.

6. Arranging for an on-site meeting prior to commencing winter construction to assure that all special winter construction measures will be implemented and to review the specific requirements of this plan for winter construction.

All certifications, inspection forms, and written reports prepared by the qualified representative(s) shall be filed with the Owner, and the Permit File contained on the project site. All written certifications, inspection forms, and written reports must be filed within one (1) week of the inspection date.

The Contractor has sole responsibility for complying with the erosion/sediment control report, including control of fugitive dust, and shall be responsible for any monetary penalties resulting from failure to comply with these standards.

Once construction has been completed, long-term maintenance of the stormwater management system will be the responsibility of the applicant. Inspection and Maintenance items with a list of maintenance requirements and frequency are described in a separate document. In the event of defective workmanship or any failure by the contractor and its subcontractors to adhere to the Standards set forth in these documents, the Contractor shall be responsible to correct, at its sole cost, any latent defects together with reimbursement of Owner for any expenses borne by the Owner up to the time of said correction. This provision shall remain in effect beyond any stated or implied warranty period.

O. PRECONSTRUCTION CONFERENCE

Prior to any construction at the site, representatives of the Contractor, the Owner, the City of Portland, and the site design engineer and any personnel identified in the permit conditions shall meet to discuss the scheduling of the site construction and the designation of the responsible parties for implementing the plan. The Contractor shall be responsible for scheduling the meeting. Prior to the meeting, the Contractor will prepare a detailed schedule and a marked-up site plan indicating areas and components of the work and key dates showing date of disturbance and completion of the work. The Contractor shall conduct a meeting with employees and sub-contractors to review the erosion control plan, the construction techniques which will be employed to implement the plan, and provide a list of attendees and items discussed at the meeting to the Owner. Three copies of the schedule, the Contractor's meeting minutes, and marked-up site plan shall be provided to the Owner.

P. APPENDICES

Appendix A – Seeding Plan

Appendix B – Sample Erosion Control Compliance Certification and Inspection Forms

Q. PLAN REFERENCES

Drawings C-6.1 to C-6.4 Erosion/Sediment Control Plans and Details

APPENDIX A

Seeding Plan

PERMANENT SEEDING PLAN (SEED MIX "A")

Project: Canal Landing New Yard

Site Location: Portland, ME

X Permanent Seeding _____ Temporary Seeding

1. **Area to be Seeded:** Approximately TBD acre(s) or _____/M. Sq. Ft.

2. **Instructions on Preparation of Soil:** Prepare a good seed bed for planting method used (do not over compact).

3. **Apply Lime as Follows:** _____ #/acres or 138# /M Sq. Ft. or per soil test

4. **Fertilize:** _____ pounds of _____ - _____N-P-K/ac.

   20 pounds of 10-20-20 N-P-K/M Sq. Ft. or per soil test

5. **Method of Applying Lime and Fertilizer:** Spread and work into the soil before seeding.

6. **Seed with the following mixture:**

   Blue Stem
   Rye
   Switch Grass
   Aster
   Goldenrod
   Milkweed

7. **Mulching Instructions**: Apply at the rate of _____ tons per acre or 230 pounds per M. Sq. Ft.

8. **Application:**

Type	Unit#	Tons, Etc.
Total Lime	138	#/1,000 s.f.
Total Fertilizer	20	#/1,000 s.f.
Total Seed	1	#/1,000 s.f.
Total Mulch	230	#/1,000 s.f.
Total Other	0	0

9. **Remarks:**

   Seeding dates April 15 to May 31 and August 1 until September 1. Permanent seeding should be made prior to September 1 or as a dormant seeding after the first killing frost and before the first snowfall. If seeding cannot be done within these seeding dates, temporary seeding and mulching shall be used to protect the site. Permanent seeding shall be delayed until the next recommended seeding period.

   Fertilizer requirements shall be subject to actual test results of the topsoil used for the project. The Contractor shall be responsible for providing topsoil test results for pH and recommended fertilizer application rates to the Owner.

Seed mixture shall be fresh, clean, new crop seed. Seed may be mixed by an appropriate method on the site or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers bearing the dealer's guaranteed analysis. If seed is mixed by the dealer, the Seeding Contractor shall furnish to the Owner the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.

Seed shall be purchased from a recognized distributor and shall test to a minimum percentage of 95% for purity and 85% for germination.

All loam shall have compost or peat admixtures to raise the organic content to 6%.

PERMANENT SEEDING PLAN (SEED MIX "B")

Project: Canal Landing New Yard

Site Location: Portland, ME

X Permanent Seeding _____ Temporary Seeding

7. **Area to be Seeded:** Approximately TBD acre(s) or _____/M. Sq. Ft.

8. **Instructions on Preparation of Soil:** Prepare a good seed bed for planting method used (do not over compact).

9. **Apply Lime as Follows:** _____ #/acres or 138# /M Sq. Ft. or per soil test

10. **Fertilize:** _____ pounds of _____ - _____N-P-K/ac.

    20 pounds of 10-20-20 N-P-K/M Sq. Ft. or per soil test

11. **Method of Applying Lime and Fertilizer:** Spread and work into the soil before seeding.

12. **Seed with the following mixture:**

    35% Tall Fescue
    30% Creeping Red Fescue
    20% Perennial Ryegrass
    15% Annual Ryegrass

10. **Mulching Instructions**: Apply at the rate of _____ tons per acre or 230 pounds per M. Sq. Ft.

11. **Application:**

Type	Unit#	Tons, Etc.
Total Lime	138	#/1,000 s.f.
Total Fertilizer	20	#/1,000 s.f.
Total Seed	7	#/1,000 s.f.
Total Mulch	230	#/1,000 s.f.
Total Other	0	0

12. **Remarks:**

Seeding dates April 15 to May 31 and August 1 until September 1. Permanent seeding should be made prior to September 1 or as a dormant seeding after the first killing frost and before the first snowfall. If seeding cannot be done within these seeding dates, temporary seeding and mulching shall be used to protect the site. Permanent seeding shall be delayed until the next recommended seeding period.

Fertilizer requirements shall be subject to actual test results of the topsoil used for the project. The Contractor shall be responsible for providing topsoil test results for pH and recommended fertilizer application rates to the Owner.

Seed mixture shall be fresh, clean, new crop seed. Seed may be mixed by an appropriate method on the site or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers bearing the dealer's guaranteed analysis. If seed is mixed by the dealer, the Seeding Contractor shall furnish to the Owner the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.

Seed shall be purchased from a recognized distributor and shall test to a minimum percentage of 95% for purity and 85% for germination.

All loam shall have compost or peat admixtures to raise the organic content to 6%.

TEMPORARY SEEDING PLAN (EROSION CONTROL MIX)

Project: Canal Landing New Yard

Site Location: Portland, ME

X Permanent Seeding X Temporary Seeding

1. **Area to be Seeded:** Approximately 0.5 acre(s) or _____/M. Sq. Ft.

2. **Instructions on Preparation of Soil:** Prepare a good seed bed for planting method used.

3. **Apply Lime as Follows:** _____ #/acres or 138# /M Sq. Ft. or per soil test

4. **Fertilize:** _____ pounds of _____ - _____N-P-K/ac.

   20 pounds of 10-10-10 N-P-K/M Sq. Ft. or per soil test

5. **Method of Applying Lime and Fertilizer:** Spread and work into the soil before seeding.

6. **Seed with the following mixture:**

Annual Rye-grass	50%
Timothy	25%
Winter Rye	25%

7. **Mulching Instructions**: Apply at the rate of _____ tons per acre or 230 pounds per M. Sq. Ft.

8. **Application:**

Type	Unit#	Tons, Etc.
Total Lime	138	#/1,000 s.f.
Total Fertilizer	20	#/1,000 s.f.
Total Seed	1	#/1,000 s.f.
Total Mulch	230	#/1,000 s.f.
Total Other		

9. **Remarks:**
   For areas with slopes >10% and fall and winter erosion control areas, mulch netting shall be used per manufacturer's specifications.

   R Permanent seeding should be made prior to September 1 or as a dormant seeding after the first killing frost and before the first snowfall. If seeding cannot be done within these seeding dates, temporary seeding and mulching shall be used to protect the site. Permanent seeding shall be delayed until the next recommended seeding period.

   Fertilizer requirements shall be subject to actual test results of the topsoil used for the project. The Contractor shall be responsible for providing topsoil test results for pH and recommended fertilizer application rates to the Owner.

   Seed mixture shall be fresh, clean, new crop seed. Seed may be mixed by an appropriate method on the site or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be

delivered in the original containers bearing the dealer's guaranteed analysis. If seed is mixed by the dealer, the Seeding Contractor shall furnish to the Owner the dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.

Seed shall be purchased from a recognized distributor and shall test to a minimum percentage of 95% for purity and 85% for germination.

All loam shall have compost or peat admixtures to raise the organic content to 6%.

APPENDIX B

Sample Erosion Control Compliance Certification and Inspection Forms

MAINE CONSTRUCTION GENERAL PERMIT

CONTRACTOR/SUBCONTRACTOR CERTIFICATION

PROJECT INFORMATION

Project Name: Canal Landing New Yard

Address: Portland, Maine

CONTRACTOR/SUBCONTRACTOR INFORMATION

Firm Name:

Address:

Telephone:

Type of Firm:

CERTIFICATION STATEMENT

"I certify under penalty of law that I understand the terms and conditions of the Maine Construction General Permit (MCGP) permit that authorizes the stormwater discharges associated with construction activity from the project site identified as part of this certification."

_____

Signature

_____

Typed Name

_____

Title

_____

Date

MAINE CONSTRUCTION GENERAL PERMIT

INSPECTION REPORT

PROJECT INFORMATION

Project Name: Canal Landing New Yard

Address: Portland, Maine

INSPECTOR INFORMATION

Representative Name: _____

Firm: _____

Title: _____

Qualifications: _____

Weather and Soil Conditions: _____

INSPECTION SUMMARY

Date of Inspection: _____

Major Observations: _____

_____

_____

_____

1. Attach the following to the Report:

   a. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

   b. A description of the condition of all natural surface water bodies located within, or immediately adjacent to, the property boundaries of the construction site which received runoff from disturbed areas. This shall include identification of any discharge of sediment to the surface water body;

   c. Identification of all erosion and sediment control practices that need repair or maintenance.

   d. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

   e. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

f. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPP and technical standards;

g. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

h. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The qualified representative shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The qualified representative shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The qualified representative shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

2. Within one business day of the completion of an inspection, the *qualified representative* shall notify the owner the appropriate contractor or subcontractor of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

3. All inspection reports shall be signed by the *qualified representative*. The inspection reports shall be maintained on site.

THE FACILITY IS IN COMPLIANCE WITH THE PLAN WITH THE FOLLOWING EXCEPTIONS:

_____

_____

_____

_____

ACTIONS NECESSARY TO BRING FACILITY INTO COMPLIANCE:

_____

_____

REQUIRED MODIFICATIONS TO (MUST BE SUBMITTED WITHIN 2 DAYS OF INSPECTION TO OWNER FOR APPROVAL):

_____

_____

_____

_____

CERTIFICATION STATEMENT:

"I certify under penalty of law that this document and all Appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the systems, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of find and imprisonment for knowing violations."

_____
Signature

_____
Typed Name

_____
Title

_____
Date